

Surface-Mount Ultrafast Avalanche Rectifiers

eSMP® Series



Top view

Bottom view

SMF (DO-219AB)

Cathode Anode

LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	200 V, 400 V, 600 V, 800 V, 1000 V
I_{FSM}	30 A, 25 A
t_{rr}	75 ns
I_R	1 μ A
V_F at $I_F = 1$ A	1.4, 1.6 V
E_{AS}	20 mJ
T_J max.	175 °C
Package	SMF (DO-219AB)
Circuit configuration	Single

FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated pellet chip junction
- Ultrafast recovery times for high frequency
- Low reverse current
- Meets MSL level 1, per J-STD-020; LF maximum peak of 260 °C
- Wave and reflow solderable
- AEC-Q101 qualified
 - Automotive ordering code: base P/NHM3
- Compatible to SOD-123W package case outline
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


RoHS
 COMPLIANT
 HALOGEN
FREE

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters, and freewheeling diodes for consumer, automotive, and telecommunication.

MECHANICAL DATA

Case: SMF (DO-219AB)

Molding compound meets UL 94 V-0 flammability rating
 Base P/N-M3 - halogen-free, RoHS-compliant
 Base P/NHM3 - halogen-free, RoHS-compliant and AEC-Q101 qualified

Terminals: matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 and HM3 suffix meets JESD 201 class 2 whisker test

Polarity: color band denotes cathode end

MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted)

PARAMETER	SYMBOL	AU1FD	AU1FG	AU1FJ	AU1FK	AU1FM	UNIT
Device marking code		AUD	AUG	AUJ	AUK	AUM	
Max. repetitive peak reverse voltage	V_{RRM}	200	400	600	800	1000	V
Average forward current	$I_{F(AV)}$	1					A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	30		25			A
Non-repetitive avalanche energy at $I_{AS} = 1.0$ A, $T_A = 25$ °C	E_{AS}	20					mJ
Operating junction and storage temperature range	T_J, T_{STG}	-55 to +175					°C

**ELECTRICAL CHARACTERISTICS** ($T_J = 25\text{ }^\circ\text{C}$ unless otherwise noted)

PARAMETER	TEST CONDITIONS	SYMBOL	AU1FD	AU1FG	AU1FJ	AU1FK	AU1FM	UNIT
Maximum instantaneous forward voltage	$I_F = 1.0\text{ A}$	$V_F^{(1)}$	$T_J = 25\text{ }^\circ\text{C}$		1.5		1.85	V
			$T_J = 125\text{ }^\circ\text{C}$		1.4		1.6	
Maximum reverse current	Rated V_R	$I_R^{(2)}$	$T_J = 25\text{ }^\circ\text{C}$		1			μA
			$T_J = 125\text{ }^\circ\text{C}$		100			
Maximum reverse recovery time	$I_F = 0.5\text{ A}$, $I_R = 1.0\text{ A}$, $I_{rr} = 0.25\text{ A}$	t_{rr}	75					ns
Typical junction capacitance	4.0 V, 1 MHz	C_J	12.2		8.2			pF

Notes

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width $\leq 40\text{ ms}$

THERMAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	AU1FD	AU1FG	AU1FJ	AU1FK	AU1FM	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)(2)}$	130					$^\circ\text{C/W}$
	$R_{\theta JM}^{(1)}$	20					

Notes

- (1) Free air, mounted on recommended PCB, 2 oz. pad area; thermal resistance $R_{\theta JA}$ - junction to ambient; $R_{\theta JM}$ - junction to mount
(2) The heat generated must be less than the thermal conductivity from junction-to-ambient: $dP_D/dT_J < 1/R_{\theta JA}$

ORDERING INFORMATION (Example)

PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
AU1FM-M3/H	0.0145	H	3000	7" diameter plastic tape and reel
AU1FM-M3/I	0.0145	I	10 000	13" diameter plastic tape and reel
AU1FMHM3/H ⁽¹⁾	0.0145	H	3000	7" diameter plastic tape and reel
AU1FMHM3/I ⁽¹⁾	0.0145	I	10 000	13" diameter plastic tape and reel

Note

- (1) AEC-Q101 qualified



RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

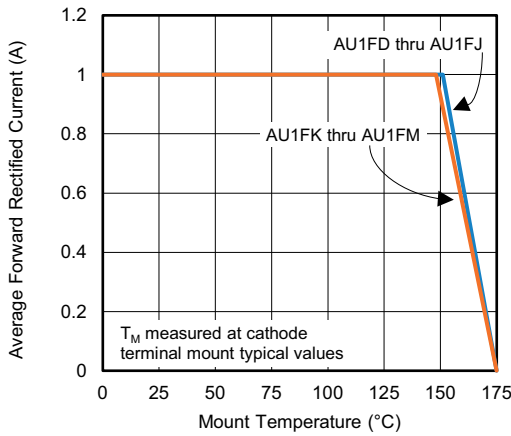


Fig. 1 - Maximum Forward Current Derating Curve

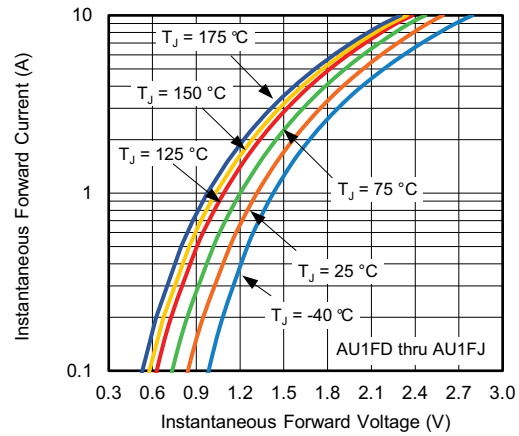


Fig. 4 - Typical Instantaneous Forward Characteristics

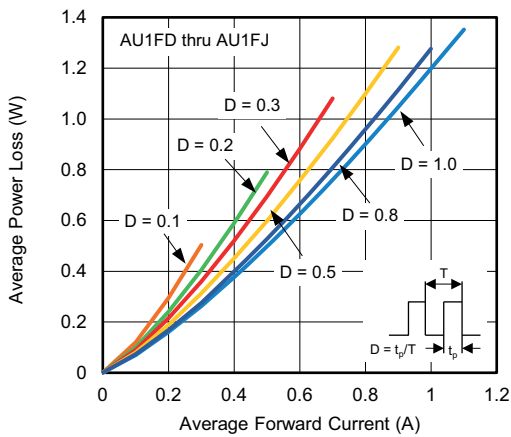


Fig. 2 - Forward Power Loss Characteristics

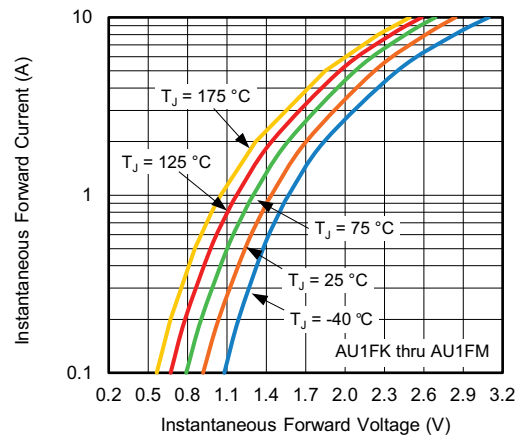


Fig. 5 - Typical Instantaneous Forward Characteristics

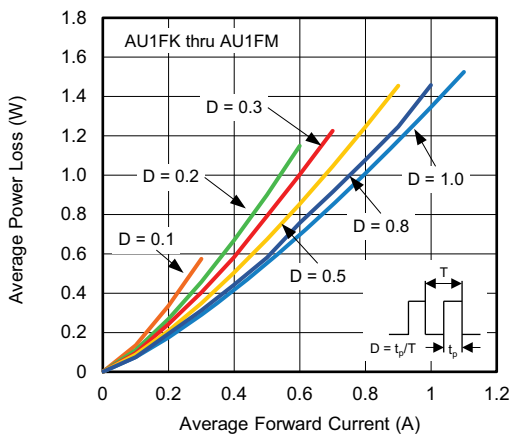


Fig. 3 - Forward Power Loss Characteristics

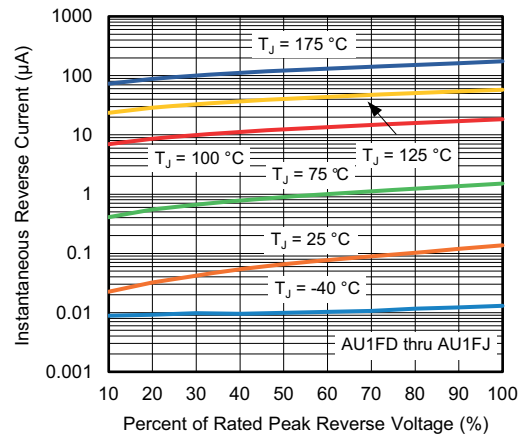


Fig. 6 - Typical Reverse Characteristics

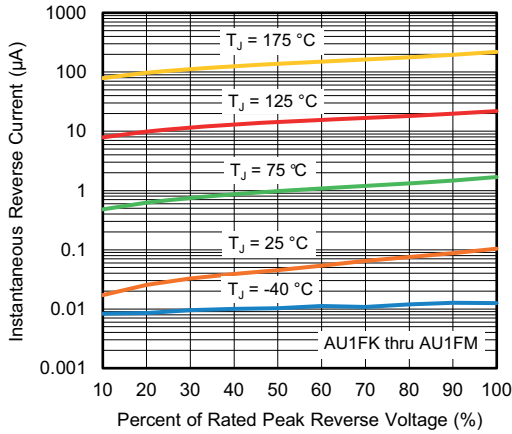


Fig. 7 - Typical Reverse Characteristics

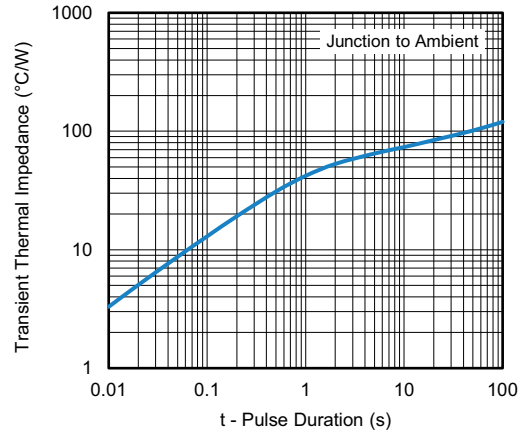


Fig. 9 - Typical Transient Thermal Impedance

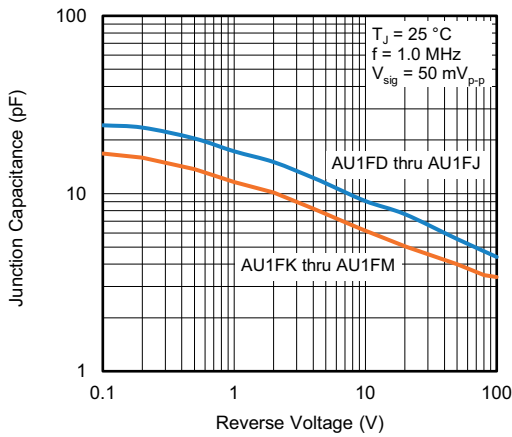
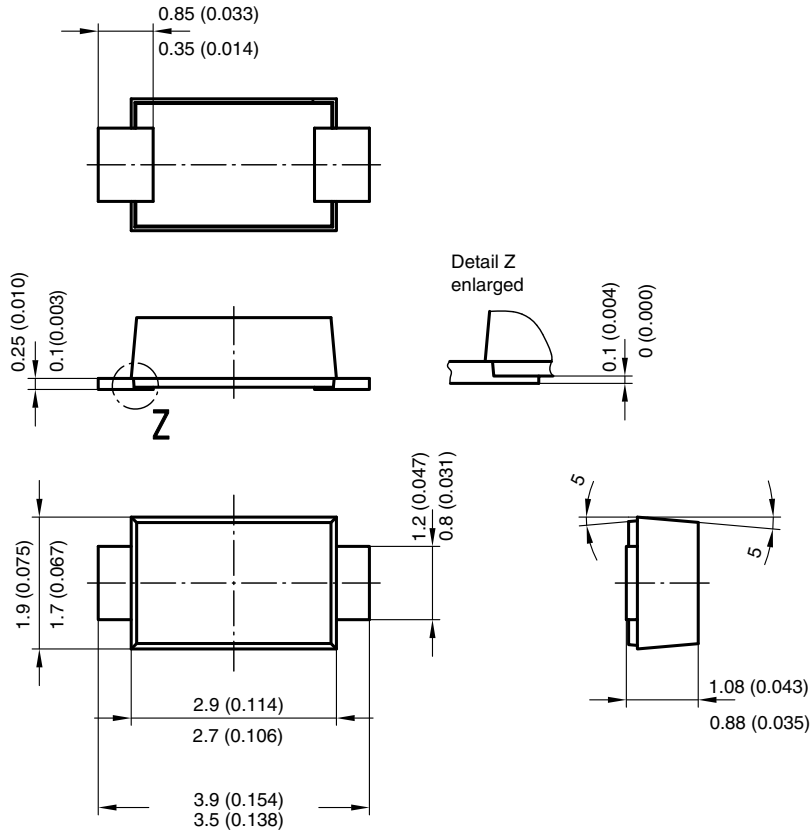


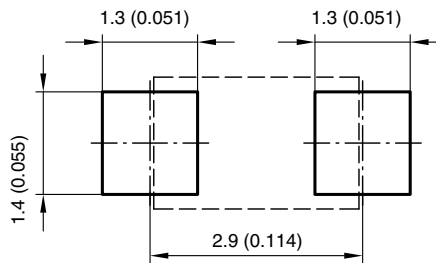
Fig. 8 - Typical Junction Capacitance



PACKAGE OUTLINE DIMENSIONS in millimeters (inches)



Foot print recommendation:



Created - Date: 15. February 2005
 Rev. 3 - Date: 13. March 2007
 Document no.: S8-V-3915.01-001 (4)
 17247



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